# Nicholas Marks

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## EDUCATION

**Northwestern University**, Evanston, IL
B.S. Mechanical Engineering – Aerospace Concentration, Minor in Spanish — June 2022
M.S. Mechanical Engineering – Robotics Concentration — Aug 2023
GPA: 3.84/4.00

## SKILLS

**Programming:** Python, C++, C, Rust, MATLAB, Bash
**Software:** ROS/ROS2, Linux, Git, SolidWorks, Onshape, Siemens NX, LaTeX
**Shop/lab tools:** 3D printing, oscilloscopes, soldering, composites manufacturing
**Certifications:** NAR Level 2 High Power Rocketry Certification

## PROFESSIONAL EXPERIENCE

***Engineering Intern (Automation) – Applied Thin Films Inc. (July 2021 – September 2022)***

- Designed, prototyped, and tested a 4-axis tabletop CNC machine from scratch for automating the infiltration process of composite layups
- Wrote a G-code generator using Python to produce and simulate rolling patterns for the automated composite layup system

***X-Ray Optics Researcher – Northwestern Univ. CIERA, Prof. Melville Ulmer's Group (Summers 2019, 2020)***

- Wrote MATLAB programs to analyze surface profile data of deformable mirrors collected from a Shack-Hartmann wavefront sensor
- Wrote embedded firmware for switching between AC and DC power supplies remotely depending on the output of a MATLAB data analysis program

***Publications***

Melville P. Ulmer, Mohammadreza Jalilvand, **Nicholas A. Marks** et al., "...applying magnetic smart materials...to produce correctable and deployable space telescopes"; https://doi.org/10.1117/12.2564726

## ADDITIONAL EXPERIENCE

***Teaching Assistant: Scientific & Embedded Programming in Python – Northwestern Univ. (Fall 2023)***

- Assisted in homework and exam creation, holding office hours, and grading

***Extended Kalman Filter SLAM on the Turtlebot3 – (Winter 2023)***

- Implemented an Extended Kalman Filter (EKF) simultaneous localization and mapping (SLAM) algorithm on the Turtlebot3 robot from scratch in C++ and ROS2

***Chief Engineer – NUSTARS Rocketry Team, Sept 2021 – June 2022***

- Oversaw the design and construction of five high power rockets which were successfully flown in a collegiate rocketry competition
- Designed, built, and launched a NAR Level 2 Certification rocket from scratch

***Launch Vehicle Team Lead – NUSTARS NASA Student Launch Team, Sept 2020 – May 2021***

- Led the design and production of the club's first ever 100% in-house built launch vehicle including material selection, flight dynamics simulation, manufacturing, and assembly